UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,345	12/18/2000	Minoru Mukaida	F-6783	5183

7590 03/01/2004

BRUCE S. LONDA
NORRIS MCLAUGHLIN & MARCUS
220 EAST 42ND STREET
30TH FLOOR
NEW YORK, NY 10017

EXAMINER	
UHLIR, NIKOLAS J	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/740,345	MUKAIDA, MINORU	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-47* is/are pending in the application.

4a) Of the above claim(s) *39-47* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in reply to the restriction election dated 12/02/2003 and the amendment/arguments dated 07/20/2003. The applicant's arguments have been fully considered but are not persuasive. The examiner has amended the grounds of rejection to clarify the examiners position and to further the examination of this case. Applicant's specific arguments are addressed below in the section entitled "response to arguments."

Election/Restrictions

2. Applicant's election of claims 28-38 in the restriction election dated 12/02/2003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

3. Claims 39-47 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the restriction election dated 12/02/2003.

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 28-30, 34-38 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yoshimura et al. (US5906885).

7. Claim 28 requires an article with improved energy consumption efficiency, comprising a contact surface and a film formed thereon, the film having a thickness of 0.01-10μm and a viscosity of 100,000cp or less, the film comprising an antislipping agent consisting of fine particles of an average particle diameter of 10μm or less, the film comprising a polymer binder selected from the group consisting of polyethylene; a methyl, phenyl, chloro, hydroxy, acetoxy, or cyano derivitive of polyethylene; polybutadiene; a methyl or chloro derivative of polybutadiene; a copolymer of said polyethylene derivative and said butadiene derivative; silicone; polysulfide; polyurethane; modified silicone; modified epoxy; and modified acrylic.

8. Regarding these limitations, Yoshimura et al. (Yoshimura) teaches a magnetic recording medium comprising a substrate, an undercoat layer on the substrate, and a magnetic layer on the undercoat layer (column 2, lines 45-55). It is the examiners position that the surface of the underlayer taught by Yoshimura is equivalent to applicants claimed article having a contact surface. The magnetic layer is considered by the examiner to be equivalent to applicants claimed film formed on the contact surface of the article having improved energy consumption efficiency.

9. Bearing this interpretation in mind, the magnetic layer of Yoshimura is composed of a binder, magnetic particles, and abrasive particles (column 2, lines 60-67). The magnetic layer has an average thickness in the range of 0.05-1.0μ, which clearly anticipates applicants claimed thickness range. The binder of the magnetic layer can be a thermoplastic or thermosetting resin material, such as methacrylic resin (equivalent to applicants claimed modified acrylic), acrylonitrile butadiene resin (also equivalent to applicants claimed modified acrylic), epoxy type resin (equivalent to applicants claimed epoxy), polybutadiene elastomer (equivalent to applicants claimed polybutadiene), or polyurethane type resins (equivalent to applicants claimed polyurethane) (column 10, lines 7-11, column 12, lines 5-20). The examiner feels the disclosure of these materials in Yoshimura constitutes an anticipation of the binders claimed by the applicant. However, should applicant traverse this argument, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select one of the above mentioned resins from the list of resins based on the fact that Yoshimura recognizes the equivalency of these materials to the others listed as suitable for use in forming the binder.

10. The magnetic layer of Yoshimura additionally contains abrasive particles. These particles have an average particle size of 0.05-0.8μ (50-800nm) (column 7, lines 2-6). This particle size range clearly anticipates claimed particle size range. Suitable abrasive particles are made of alumina, SiO_2 (silica), Silicon Carbide, and other materials.

11. Regarding applicant's requirement that the article be "improved in energy consumption efficiency." The examiner notes that the size of the abrasive particles in

Yoshimura is specifically selected so as to enable the distance between the surface of the recording media and a magnetic head that is to read/record information to/from the media to be minimized (column 7, lines 38-45). As the gap between the head and the media increases, the output signal from the media decreases (column 7, lines 40-45). The examiner notes that the use of magnetic recording heads to read/record data to/from magnetic recording layers is well known in the art of magnetic recording media. One of the primary goals of magnetic recording media is to reduce the distance between the head and the media so as to enable the output signal from the media to be increased (the output decreases with distance because magnetic flux decreases in intensity the farther from the flux's origin). Thus, by reducing the distance between the magnetic head and the media, the flux required to read/record data from the medium is decreased. As the generation of a magnetic flux requires energy (i.e. electricity), lowering the intensity of the magnetic flux would logically correspond to a reduction in the amount of energy required to generate that flux, thus, the energy required to read the magnetic media is decreased. Further, it is also known in the art of magnetic media that as the distance between the head and the media decreases, a phenomenon known as "head slap" occurs, wherein the head contacts the surface of the media rather then floating just above its surface. This can damage or destroy the head and the media. To counter this issue, abrasive particles and/or lubricants are placed in the uppermost layers of the recording media so as to reduce the frictional characteristics of the media (either through lubrication or through providing a minute surface roughness). This quite likely to be the reason that Yoshimura utilizes an abrasive in the magnetic layer

(especially considering Yoshimura states that this is done to improve the running durability of the medium). The examiner considers this reduce in friction and/or potential reduction in damage due to head slap to be equivalent to applicants claimed improvement in energy consumption efficiency.

12. Claim 29 requires a portion of the antislipping agent to be partially exposed throughout a surface of the film. The examiner notes that the thickness of the magnetic layer of Yoshimura is taught to be 0.05-1.0μ, and the particle diameter of the abrasive particles is 0.05-0.8μ. Given that Yoshimura clearly teaches a thickness (0.05μ) for the magnetic layer that is less than a specified particle size (0.8μ), the examiner feels that this is a clear anticipation of applicants claim 29 requirements. However, should applicant traverse this argument, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the magnetic layer in Yoshimura to a thickness of 0.05μ and to utilized abrasive particles having an average particle diameter of 0.8μ in that magnetic layer, in lieu of the fact that Yoshimura explicitly teaches that this thickness and abrasive particle diameter is suitable.

13. Claim 30 requires the particles to be made of one of the specific materials listed. As set forth above, Yoshimura teaches that the abrasive particles can be formed from silica, alumina, or silicon carbide (see column 7, lines 50-60). Thus, Yoshimura clearly anticipates applicants claim 30 requirements. However, should applicant traverse this argument, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize silica, alumina, or silicon carbide as the abrasive particles

in Yoshimura as Yoshimura teaches the equivalency of these materials to the other materials listed as suitable for use as the abrasive.

14. Claim 34 requires the film thickness to be between 0.01-1μ. This limitation is met as set forth above for claim 1.

15. Claim 34 requires the film thickness to be between 0.01-0.1μ. The examiner notes that the thickness of the magnetic layer of Yoshimura is taught to be 0.05-1.0μ. Thus, as Yoshimura explicitly discloses a thickness range that has an endpoint in applicants claimed range, Yoshiumura anticipates the limitations of claim 34. However, should applicant traverse this argument, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the magnetic layer of Yoshimura to a thickness of 0.05μ, in lieu of the fact that Yoshimura explicitly teaches that this thickness is suitable.

16. Claim 36 requires the particle diameter to be between 10nm and 1μ.This limitation is met as set forth above for claim 1.

17. Claim 37 requires the particle diameter to between 10nm-1μ. This limitation is met as set forth above for claim 1.

18. Claim 38 requires the particle diameter to be between 10nm-100nm. Yoshimura teaches that the particle diameter is 0.05-0.8μ (50-800nm). Thus, as the particle size range of Yoshimura has an endpoint within the applicants claimed range, Yoshimura anticipates the limitations of claim 38. However, should applicant traverse this argument, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize particles having a diameter of 0.05μ as the abrasive in

Yoshimura, in lieu of the fact that Yoshimura explicitly teaches that this particle diameter is suitable for the abrasive.

Claim Rejections - 35 USC § 103

19. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

20. Claims 28-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Craven (US3878147) in view of The Encyclopedia of Polymer Science, Vol. 3, November 1985, pg. 552.

21. It is noted that a copy of both of the above cited references accompanied a prior office action and so are not included with this office action.

22. Claim 28 requires an article with improved energy consumption efficiency, comprising a contact surface and a film formed thereon, the film having a thickness of 0.01-10μm and a viscosity of 100,000cp or less, the film comprising an antislipping agent consisting of fine particles of an average particle diameter of 10μm or less, the film comprising a polymer binder selected from the group consisting of polyethylene; a methyl, phenyl, chloro, hydroxy, acetoxy, or cyano derivitive of polyethylene; polybutadiene; a methyl or chloro derivative of polybutadiene; a copolymer of said polyethylene derivative and said butadiene derivative; silicone; polysulfide; polyurethane; modified silicone; modified epoxy; and modified acrylic.

23. Regarding these limitations, Craven teaches a composition that is used to increase the friction of surfaces on ice, particularly the surfaces of automobile and truck tires (column 1, lines 5-8). The composition is a mixture of a binder and fine particles

that possesses excellent adherence to rubber substrates and provides a high level of friction on icy roads (column 1, lines 21-25). The composition comprises 5-25% by weight of a soluble elastomer, 43-92.99% by weight of a solvent for the elastomer, and 2-20% by weight of dispersed inorganic particles having a particle size of about .2-105 μm. Craven teaches that suitable elastomers for the coating composition include polyurethane, as well as a number of other elastomers.

24. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to select polyurethane as the flexible polymeric binder, as polyurethane is taught by Craven to be equivalent to the other binders listed.

25. Regarding the applicant requirement that the article with improved energy consumption efficiency comprise an antislipping agent consisting of fine particles of an average diameter of 10μm or less. The examiner notes that the claim language utilized by the applicant renders the claim open to containing particles of antislipping agent that are greater then 10μ. Specifically, the applicant requires the article with improved energy consumption efficiency to *comprise an* antislipping agent *consisting* of particles having an average diameter ≤10μm. By only requiring that the article *comprise an* antislipping agent *consisting* of particles having a diameter ≤10μ, the applicant merely requires that some of the antislipping particles to have the required particle diameter.

26. Bearing this interpretation in mind, Craven teaches the addition of particles having an average diameter in the range of about 0.2-105μ. As about 0.2μ is completely encompassed by the applicants claimed range, at least some of the antislipping particles in craven will have the average diameter required by claim 28.

27. Regarding applicants required viscosity limitation. Craven does not specifically teach this requirement. However, it is noted that Craven does teach the application of the coating via various methods, including brushing, dipping, spraying etc... (column 2, lines 63-68).

28. Further, The Encyclopedia of Polymer Science, Vol. 3, November 1985, pg. 552 teaches common coating methods and the viscosity range of compounds that are coated utilizing those methods. From this disclosure, the examiner takes the position that the viscosity of the coating is a results effective variable. It would have been obvious to one with ordinary skill in the art to optimize the viscosity of the coating of Craven to meet the requirements of the coating method to be utilized.

29. Regarding the applicants claimed thickness requirement. The examiner notes that Craven teaches that the thickness of the film is "about 0.5 mils." It is the examiners position that "about .5 mils" encompasses .4 mils, which is equivalent to applicants claimed 10μ. Thus, Craven meets this limitation. However, should applicant traverse this argument, it is noted that Craven teaches that a film that is 1-2 mils thick will typically remain on the tire for 5-10 miles, depending on road conditions (column 3, lines 13-15). Thus the thickness of the film is a result effective variable, with a thinner film remaining on the tire for shorter distances, and vice versa.

30. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to control the thickness of the Craven film to suit the distance to be traveled. Shorter distances would require a thinner coating, thereby conserving material.

31. Further, should applicant traverse this argument, the examiner notes once again that Craven teaches that a film having a thickness of 1-2mils will remain on the tire for ~5-10 miles. This clearly implies that as the vehicle is driven, the coating on the tires wears down. Thus, due to this wear, at some point the coating taught by Craven will have a thickness within the applicants claimed range. Further, assuming a balanced and aligned tire, as the tire is rotated the coating will wear evenly. Thus, the average thickness of the craven coating will at some point be within the applicants claimed range. This is true even if the coating does not wear down per se but rather portions of the coating flake off the tire, resulting in a coating having a "Swiss cheese" appearance. Even should portions of the coating flake off, the average thickness of the coating will eventually decrease to within the applicants claimed range.

32. Claim 29 requires at least a portion of the particles of antislipping agent to be partially exposed throughout a surface of the film. It is noted that applicants claim language, i.e. "at least some", only requires 1 or more particles to be exposed at the surface of the film. It is acknowledges that Craven does not explicitly teach this limitation. However, as set forth above for claim 28, the coating of Craven clearly wears down as the vehicle is driven. Thus, at some point the particles embedded in the coating of Craven will be exposed at the surface of the film as the film wears down.

33. Claim 30 requires the antislipping agent to comprise silicon oxide, aluminum oxide, cerium oxide, silicon carbide, or a fine particulate organic material. Craven teaches that a suitable material for the particulate material include aluminum oxide,

silica (synonymous with silicon oxide), silicon carbide, and other inorganic particles (column 2, lines 8-22).

34. Claims 31-33 further limit the viscosity range of the coating. The examiner maintains that it would be obvious to alter the viscosity of the coating to enable a desired coating method to be utilized, as set forth above.

35. Claims 34-35 further limit the thickness of the film. The examiner maintains that due to the clear implication in Craven that the coating wears down over time, at some point the coating of Craven will have a thickness within the applicants claimed range.

36. Claim 36 and 27 are met as set forth above for claim 28.

37. Claims 38 requires the particles to have a diameter in the range of 10-100nm. The examiner notes that Craven teaches that the particles have a suitable particle size of "about" 0.2-105μ. As "about" 0.2μ encompasses 0.1μ (equivalent to 100nm), the limitations of claim 38 are met.

Response to Arguments

38. Applicant's arguments filed 7/20/2003 have been fully considered but they are not persuasive. The applicants have once again argued against the examiners assertion that Craven teaches the claimed limitations, and primarily relies on an argument that the thickness of the claimed coating is a critical limitation that allows the applicant to obtain unexpected improvements in adhesion.

39. The bulk of the applicants arguments with respect to the teachings of Craven and the requirements of the instant claims are rendered moot in lieu of the new grounds of

rejection presented above and a more clear explanation of the examiners interpretation of the Craven reference.

40. The examiner acknowledges that the improvement in adhesion may be unexpected. However, applicants showing *cannot* be considered to be persuasive because it is not commensurate in scope with the claims. The applicant's assertion is assumed to rely on the data presented in the specification, more specifically the data shown in figure 3. It is important to note that the instant claims are open to "any" article having improved energy consumption efficiency. While it is true that applicant goes in to some discussion of energy consumption efficiency in the specification, the term "energy consumption efficiency" is not specifically defined by the specification or the claims. Thus it is clear that the requirement of an article having improved energy consumption efficiency is very broad. However, the data shown in figure three was generated when the applicants coating was applied to the surface of a rubber tire of an automobile. This data certainly cannot be considered to be applicable to every type of article made of every type of material. A very strained interpretation would be that the data shows that the thickness is critical when applied to rubber surfaces. However, as all rubbers are not created equal (I.e. styrene ethylene butadiene styrene rubber is not equivalent to silicone rubber), a reasonable interpretation of this data would be that it shows a criticality of the thickness requirement when applied to specific types of rubber surfaces, i.e. the rubber surface of a tire. Although it is not made explicitly clear, the examiner notes that the applicants data may also apply to the rubber surfaces of shoes as well, given that the two primary applications of the applicants coating discussed in the

specification are its applicability to the surfaces of vehicle tires and shoes. However, as applicant's argument is not commensurate in scope with the claims, it is unpersuasive.

41. Applicants have also made various arguments with respect to Cravens failure to explicitly teach applicants claimed particle size. Specifically, applicants believe the claim language requires all of the antislipping agent particles to have an average diameter $\leq 10\mu$. The examiner respectfully disagrees. By requiring that the film "comprise an" antislipping agent, the applicant merely requires some of the particles to have the requisite diameter. If applicants wish to limit the particle size range of the particles, the examiner respectfully request the applicant consider terminology that specifically limits the antislipping agents present in the film to particles having the desired diameter range. For example, rather then claim "comprise an" antislipping agent, the applicant may wish to consider the language "wherein the film contains antislipping agents, wherein the antislipping agents consist of fine particles having a diameter $\leq 10\mu$."

42. Finally, the new grounds of rejection over Yoshimura et al. rebut applicant's arguments in their entirety. In addition this rejection clearly elucidates the broad scope of the applicants claims as currently presented. It is noted that functional language, i.e. requiring the article to be designed to come into contact with the ground would not overcome this reference, as that type of functional language is merely intended use and does not structurally define the article over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J. Thibodeau can be reached on 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NJU
nju

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700